

What is claimed is:

1. A water level sensor for measuring a water level of a filtered water container, the water level sensor comprising:

a detection circuit; and

a detection sensor in electrical communication with the detection circuit, the detection sensor comprising a first electrode pair, the first electrode pair comprising a first electrode and a second electrode, wherein

said first electrode and said second electrode are extended along a length of the filtered water container and wherein said first electrode and said second electrode are spaced sufficiently far apart from each other that an electrical property associated with said first electrode and said second electrode that changes with changes in the water level in said filtered water container is detectable by said detection circuit.

2. The water level sensor of claim 1 wherein the electrical property associated with said first electrode and said second electrode is one or more of:

a resistance across said first electrode and said second electrode, a change in a capacitance between said first electrode and said second electrode, a voltage across said first electrode and said second electrode, and a current across said first electrode and said second electrode.

3. The water level sensor of claim 1, further comprising:

a control unit that is in electrical communication with said detection circuit, wherein the control unit determines one or more of a current water level and a change in current water level in said filtered water container based on signals received from said detection circuit.

4. The water level sensor of claim 3, further comprising a switch that is in electrical communication with said control unit

wherein, when said switch is in a first state, said control unit determines that said filtered water container is in a nonfunctional state, and

when said switch is in a second state, said control unit determines that said filtered water container is in a functional state, and wherein

said control unit determines the current water level or the change in water level when said filtered water container is in said functional state, and

said control unit does not determine the current water level or the change in water level when said filtered water container is in said nonfunctional state.

5. The water level sensor of claim 4 wherein said switch is toggled between said first state and said second state by a user.

6. The water level sensor of claim 4 wherein said switch is positioned within said filtered water container so that

said switch is in said first state when a lid of the filtered water container is open, and said switch is in said second state when said lid is closed.

7. The water level sensor of claim 4 wherein

said switch is a bubble level switch that comprises a first bubble sensor electrode and a second bubble sensor electrode in an enclosure trapping (i) a fluid and (ii) a bubble;

wherein

said bubble sensor electrode is in said first state when said bubble contacts one of said first bubble sensor electrode and said second bubble sensor electrode; and

said bubble sensor electrode is in said second state when said bubble does not contact said first bubble sensor electrode or said second bubble sensor electrode.

8. The water level sensor of claim 3 wherein:

said control unit determines that said filtered water container is in a functional state when a rate of change in a water level in said filtered water tank is below a predetermined rate;

said control unit determines that said filtered water container is in a nonfunctional state when a rate of change in a water level in said filtered water tank is above a predetermined rate;

said control unit determines the current water level or the change in water level when said filtered water container is in said functional state, and

said control unit does not determine the current water level or the change in water level when said filtered water container is in said nonfunctional state.

9. The water level sensor of claim 1 wherein the water filter container is fitted with a hopper that holds unfiltered water and wherein the hopper is fitted at its base with a replaceable filter cartridge so that water is filtered by draining through the filter cartridge into a lower portion of the water filter container.

10. The water level sensor of claim 3, further comprising a display in electrical communication with said control unit, wherein the control unit is capable of causing the display to display information derived from the current water level or the change in current water level.

11. The water level sensor of claim 3, further comprising a display in electrical communication with said control unit, wherein the control unit is capable of causing the display to display one or more of a water level of said filtered water level container, a status of a water filter that is disposed within said filtered water container, a determination of whether said filtered water container is in a functional state, a determination of whether said filtered water container is in a nonfunctional state, a time elapsed or an amount of filtered water consumed since a last filter cartridge change, a current time, a warning of overfilling, and a reminder to refill.

12. The water level sensor of claim 3 wherein said detection sensor further comprises one or more additional electrode pairs,

each electrode pair in said one or more additional electrode pairs comprising a first electrode and a second electrode that is extended along a length of the filtered water container and wherein the first electrode and the second electrode in each electrode pair is spaced sufficiently far apart from each other that an electrical property associated with the first electrode and the second electrode that changes with changes in the water level in said filtered water container is detectable by said detection circuit.

13. The water level sensor of claim 12 wherein the electrical property associated with said first electrode and said second electrode in said one or more additional electrode pairs is one or more of:

a resistance across said first electrode and said second electrode, a capacitance between said first electrode and said second electrode, a voltage across said first electrode and said second electrode, and a current across said first electrode and said second electrode.

14. The water level sensor of claim 12 wherein said control unit determines one or more of a current water level and a change in current water level based on the electrical properties associated with at least two electrode pairs.

15. The water level sensor of claim 1, further comprising a control unit that is in electrical communication with said detection circuit, wherein the control unit monitors a status of a water filter that is in said filtered water container based on signals received from said detection circuit.

16. A water level sensor for measuring a water level of a filtered water container, the water level sensor comprising:

a detection circuit; and

a detection sensor, the detection sensor in electrical communication with the detection circuit and the detection sensor comprising a sensor strip that is extended along a length of the filtered water container, the sensor strip housing a plurality of electrode pairs, each electrode pair in the plurality of electrode pairs comprising a first electrode and a second electrode and each electrode pair in the plurality of electrode pairs in electrical communication with said detection circuit, wherein

said first electrode and said second electrode in an electrode pair in the plurality of electrode pairs are spaced sufficiently far apart from each other on said sensor strip so that an electrical property associated with the first electrode and the second electrode that changes with changes in the water level in said filtered water container, is detectable by said detection circuit.

17. The water level sensor of claim 16 wherein the electrical property associated with said first electrode and said second electrode is one or more of:

a resistance across said first electrode and said second electrode, a capacitance between said first electrode and said second electrode, a voltage across said first electrode and said second electrode, and a current across said first electrode and said second electrode.

18. The water level sensor of claim 16 wherein said plurality of electrode pairs comprises between 2 electrode pairs and 10 electrode pairs.

19. The water level sensor of claim 16 wherein said plurality of electrode pairs comprises more than 10 electrode pairs.

20. The water level sensor of claim 16, further comprising:

a control unit that is in electrical communication with said detection circuit, wherein the control unit determines one or more of a current water level and a change in current water level in said filtered water container based on signals received from said detection circuit.

21. The water level sensor of claim 20, wherein said detecting circuit includes a first lead (a), a second lead (b) and a third lead (c), wherein

said first lead (a) is in electrical communication with said first electrode in an electrode pair in said plurality of electrodes;

said second lead (b) is in electrical communication with said second electrode in an electrode pair in said plurality of electrodes; and

said third lead (c) and said second lead (b) are in electrical communication across a resistor; and wherein

said control unit is programmed to

set said third lead (c) to a high voltage and said first lead (a) a low voltage each time a first voltage drop is measured at said second lead (b), and

set said third lead (c) to a low voltage and said first lead (a) to a high voltage each time a second voltage drop is measured at said second lead (b).

22. The water level sensor of claim 21 wherein said control unit is programmed to switch to a low power consumption idle state when said second lead (b) is in a high voltage state.

23. The water level sensor of claim 21 wherein said control unit is programmed to switch to a high power consumption state when said second lead (b) drops from a high voltage state to a low voltage state.

24. The water level sensor of claim 20, further comprising a switch that is in electrical communication with said control unit wherein,

when said switch is in a first state, said control unit determines that said filtered water container is in a nonfunctional state, and

when said switch is in a second state, said control unit determines that said filtered water container is in a functional state, and wherein

said control unit determines the current water level or the change in water level when said filtered water container is in said functional state, and

said control unit does not determine the current water level or the change in water level when said filtered water container is in said nonfunctional state.

25. The water level sensor of claim 24 wherein said switch is toggled between said first state and said second state by a user.

26. The water level sensor of claim 24 wherein said switch is positioned within said filtered water container so that

said switch is in said first state when a lid of the filtered water container is open, and
said switch is in said second state when said lid is closed.

27. The water level sensor of claim 24 wherein

said switch is a bubble level switch that comprises a first bubble sensor electrode and
a second bubble sensor electrode in an enclosure trapping (i) a fluid and (ii) a bubble;
wherein

said bubble sensor electrode is in said first state when said bubble contacts one
of said first bubble sensor electrode and said second bubble sensor electrode; and

said bubble sensor electrode is in said second state when said bubble does not
contact said first bubble sensor electrode or said second bubble sensor electrode.

28. The water level sensor of claim 20 wherein:

said control unit determines that said filtered water container is in a functional state
when a rate of change in a water level in said filtered water tank is below a predetermined
rate;

said control unit determines that said filtered water container is in a nonfunctional
state when a rate of change in a water level in said filtered water tank is above a
predetermined rate;

said control unit determines the current water level or the change in water level when
said filtered water container is in said functional state, and

said control unit does not determine the current water level or the change in water
level when said filtered water container is in said nonfunctional state.

29. The water level sensor of claim 16 wherein the water filter container is fitted with a
hopper that holds unfiltered water and wherein the hopper is fitted at its base with a

replaceable filter cartridge so that water is filtered by draining through the filter cartridge into a lower portion of the water filter container.

30. The water level sensor of claim 20, further comprising a display in electrical communication with said control unit, wherein the control unit is capable of causing the display to display information derived from the current water level or the change in the current water level.

31. The water level sensor of claim 20, further comprising a display in electrical communication with said control unit, wherein the control unit is capable of causing the display to display one or more of a water level of said filtered water level container, a status of a water filter that is disposed within said filtered water container, a determination of whether said filtered water container is in a functional state, a determination of whether said filtered water container is in a nonfunctional state, a time elapsed or an amount of filtered water consumed since a last filter cartridge change, a current time, a warning of overfilling, and a reminder to refill.

32. The water level sensor of claim 20 wherein said detection sensor further comprises one or more additional sensor strips, each sensor strip in the one or more additional sensor strips extended along a length of the filtered water container, and wherein each sensor strip in the one or more additional sensor strips houses a plurality of electrode pairs, each electrode pair in the plurality of electrode pairs comprising a first electrode and a second electrode and each electrode pair in the plurality of electrode pairs in electrical communication with said detection circuit.

33. The water level sensor of claim 32 wherein the control unit determines one or more of a current water level and a change in current water level based on the electrical properties associated with at least two electrode pairs.

34. The water level sensor of claim 16 wherein a single common electrode represents the first electrode in each electrode pair in said plurality of electrode pairs.

35. The water level sensor of claim 16 wherein each second electrode in all or a portion of the plurality of electrode pairs has a unique length.

36. The water level sensor of claim 20 wherein

a single common electrode represents the first electrode in each electrode pair in said plurality of electrode pairs,

each second electrode in all or a portion of the plurality of electrode pairs has a unique length; and

a length of each second electrode in all or a portion of the plurality of electrode pairs is used by said control unit to determine a water level in the filtered water container.

37. The water level sensor of claim 20 wherein a length of all or a portion of the electrode pairs in the plurality of electrode pairs is different, and

a length of each electrode pair in all or a portion of the plurality of electrode pairs is used by said control unit to determine a water level in the filtered water container.

38. The water level sensor of claim 16 further comprising:

a control that is in electrical communication with said detection circuit, wherein the control unit monitors a status of a water filter that is in said filtered water container based on signals received from said detection circuit.

39. A method of measuring a water level of a filtered water container comprising:

detecting an electrical property associated with a first electrode and a second electrode in an electrode pair, wherein said first electrode and said second electrode are extended along a length of the filtered water container and wherein said electrical property associated with said first electrode and said second electrode changes with changes in the water level in said filtered water container; and

determining a change in said electrical property thereby measuring said water level of said filtered water container.

40. The method of claim 39 wherein the electrical property associated with said first electrode and said second electrode is one or more of:

a resistance across said first electrode and said second electrode, a change in a capacitance between said first electrode and said second electrode, a voltage across said first electrode and said second electrode, and a current across said first electrode and said second electrode.

41. The method of claim 39, the method further comprising using said change in said electrical property to track a status of a water filter in said filtered water container.

42. A method of measuring a water level of a filtered water container comprising:

detecting an electrical property associated with a first electrode and a second electrode in an electrode pair in a plurality of electrode pairs on a sensor strip that is extended along a

length of the filtered water container, wherein said electrical property associated with said first electrode and said second electrode changes with changes in the water level in said filtered water container;

determining a change in said electrical property thereby measuring said water level of said filtered water container.

43. The method of claim 42 wherein the electrical property associated with said first electrode and said second electrode is one or more of:

a resistance across said first electrode and said second electrode, a change in a capacitance between said first electrode and said second electrode, a voltage across said first electrode and said second electrode, and a current across said first electrode and said second electrode.

44. The method of claim 42, the method further comprising using said change in said electrical property to track a status of a water filter in said filtered water container.